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CURVES FOR ESTIMATING LOW BLAST OVERPRESSURE

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ABSTRACT

A plot of overpressure versus distance is presented for the fractional psi pressure level. The plot provides a rapid and simple means of estimating the permissible yield at any distance from settled areas.

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CURVES FOR ESTIMATING LOW BLAST OVERPRESSURE

A graph is presented here to assist in the estimation of blast pressures below 1 psi from devices of various yields. Information is given for 1-kt and for 1-mt devices. It is recommended that a device be scaled to either 1 kt or 1 mt, depending on which yield is closer to that of the device.

The portion of the curve between 1 psi and 10 psi is that for a surface burst given by TM-23-200. For pressures below 1 psi, one-half of the peak-to-peak pressures measured by microbarograph stations at the Nevada Test Site and at the Pacific Proving Grounds were scaled to 1 kt or 1 mt, whichever was closer. A line was then drawn above and below these scattered points to represent maximum and minimum pressure values. Scatter is greater in the values obtained from the Nevada Test Site. The scatter of these points is enclosed between dashed lines. Since only kiloton devices have been fired at the Nevada Test Site, there are no Nevada data applicable to megaton-range devices.

The graph has one limitation. Since it is unlikely that microbarograph stations were located at precisely the point of greatest focusing, the maximum line represents an observed maximum, not a maximum possible.

Information from the Teapot ESS underground shot shows that in the region above 1 psi pressures fall significantly below those expected for a surface shot. However, by the time the signal reaches the 0.001- to 0.01-psi pressure levels, the signals are not appreciably different from those of a surface burst. Pressure from the Jangle underground shot approached those of a surface burst before the pressures had decayed to 1 psi.

By using the graph it is possible to determine whether or not damage is likely to occur at a known distance from a burst of a given yield. It is recommended that no modifications be made for below-surface shots.

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